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FEDERAL COMMUNICATIONS COMMISSION
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July 11, 1996

BY HAND DELIVERY

Mr. William F. Caton
Acting Secretary
Office of the Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

DOCKET FILE COPY ORIGINAL

Re: MM Docket No. 87-268
Advanced Television Systems

Dear Mr. Caton:

Transmitted herewith on behalf of the Motion Picture Association of America, Inc. are an original plus eleven copies of its Comments in response to the Commission's Fifth Further Notice of Proposed Rule Making in MM Docket No. 87-268 adopted on May 9, 1996 and released on May 20, 1996 by the Federal Communications Commission.

Respectfully submitted,

Jill L. Tresback

Jill L. Tresback

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Advanced Television Systems)	
and Their Impact Upon the)	MM Docket No. 87-268
Existing Television Broadcast)	
Service)	

COMMENTS OF
MOTION PICTURE ASSOCIATION OF AMERICA, INC.

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SUMMARY

MPAA supports the technical aspects of the Advanced Televisions Systems Committee's ("ATSC") Digital Television Standard ("ATSC Standard"), particularly: (1) the 16:9 aspect ratio and (2) interlaced and progressive scanning parameters in relation to interoperability. MPAA believes it is in the best interests of U.S. program providers to lead the way in promoting the emergence of common worldwide technical standards. The 16:9 screen aspect ratio contained in the ATSC Standard will provide maximum accommodation for the transmission of video material originally produced in different aspect ratios and will facilitate international program exchange.. Further, in light of the enormous investment to date by the industry, the government and the public in the existing telecommunications infrastructure, interoperability of digital television with other media is a critical goal of this proceeding. MPAA also believes the Standard provides the maximum interoperability with other video media resulting from a variety of scanning parameters which includes the interlaced format.

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554**

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**COMMENTS OF
MOTION PICTURE ASSOCIATION OF AMERICA, INC.**

Motion Picture Association of America, Inc. ("MPAA")¹ hereby submits its comments in response to the Fifth Further Notice of Proposed Rule Making ("Notice") adopted on May 9, 1996 and released on May 20, 1996 by the Federal Communications Commission ("Commission").

In its Notice, the Commission seeks comment on the Advanced Television Systems Committee ("ATSC") Digital Television Standard ("ATSC Standard").

¹ MPAA is a trade association representing eight of the largest U.S. producers, distributors, and exporters of theatrical motion pictures, television programming, and home video entertainment. They include: Buena Vista Pictures Distribution Inc. (Disney); Metro-Goldwyn-Mayer Inc.; Paramount Pictures Corporation; Sony Pictures Entertainment Inc.; Turner Broadcasting System Inc.; Twentieth Century Fox Film Corporation; Universal City Studios Inc.; and Warner Bros., A Division of Time Warner Entertainment Company, L.P. MPAA is also represented on the ATSC.

MPAA supports the technical aspects of the ATSC Standard, particularly: (1) the 16:9 aspect ratio and (2) interlaced and progressive scanning parameters in relation to interoperability.

I. THE 16:9 SCREEN ASPECT RATIO CONTAINED IN THE ATSC STANDARD WILL PROVIDE MAXIMUM ACCOMMODATION FOR THE TRANSMISSION OF VIDEO MATERIAL ORIGINALLY PRODUCED IN DIFFERENT ASPECT RATIOS AND WILL FACILITATE INTERNATIONAL PROGRAM EXCHANGE

The Notice indicates some recent opposition to the 16:9 screen aspect ratio contained in the ATSC Standard and cites a communication from the President of the Society of Motion Picture and Television Engineers ("SMPTE") that supports the selection of 16:9 and explains the process that resulted in the selection of that aspect ratio.² The 16:9 screen aspect ratio was originally proposed more than ten years ago as the aspect ratio that could optimally display the entire existing library of programming. It was designed to maximize the screen use with material ranging from a narrow 4:3 aspect ratio (using 75% of the screen area) to a wide 2.4:1 aspect ratio (also using 75% of the screen area). Material with aspect ratios wider than 4:3 but narrower than 2.4:1 would use a greater portion of the screen area. For example, the most common U.S. motion picture aspect ratio is 1.85:1, which would occupy 96% of the 16:9 television screen area.

Some cinematographers have objected to the 16:9 aspect ratio included in the ATSC Standard, contending that it will limit television's ability to display the full extent of the cinematographers' works. As explained in the August 28, 1995 letter of Stanley Baron, President of the Society of Motion Picture and Television Engineers and also head of the ATSC Technology Group on Distribution, this decision was

² 16:9 was chosen by SMPTE as a preferred aspect ratio in 1987 because it was more adaptable to U.S. feature films in 1.85 aspect ratios than the 1.66 aspect ratio then used in Europe and Japan for DTV. For example, 1.85:1 is the dominate aspect ratio at Universal Pictures, where in the past 5 years, 80% of feature films have been released in 1.85:1. Cinemascope 2.4:1 was used on 18 of the 87 feature films.

reached more than a decade ago after extended and careful deliberations, with extensive participation by the motion picture and television production communities. The final 16:9 ratio (1.78:1) is in fact wider than the 5:3 ratio originally sought by the electronics manufacturing industry, utilizing 75% of the total screen height for 2.4:1 material (the widest of the commonly used motion picture aspect ratios) and 75% of the screen width for 4:3 material (the standard NTSC format). While the 16:9 aspect ratio may not display in entirety each and every one of the multitude of creative material that is transmitted on a daily, continuous basis on television, a uniform aspect ratio had to be selected by the ATSC: 16:9 offers the greatest flexibility to preserve the maximum amount of original creations as they were designed and optimizes screen use over a wide range of original material aspect ratios.

Additionally, the 16:9 aspect ratio has been adopted by variety of international standards bodies. For years, manufacturers around the world have been building charged coupled device sensing arrays, picture tubes, production equipment, camera lenses and wide screen receivers in the 16:9 format.

Because of the wide variety of aspect ratios used by the motion picture industry in the U.S. and throughout the world, it is impossible to select a single aspect ratio that perfectly satisfies every need. However, as Mr. Baron's letter makes clear, it has been demonstrated that there is no difficulty in accommodating program material or motion picture films of any reasonable aspect ratio within the 16:9 format, either for production, post-production, distribution or display. Failure to recognize the value of the 16:9 aspect ratio at this late date would increase costs to consumers, cause unacceptable and unnecessary delays in implementing ATV service and severely damage many parties who already have made significant investments preparing for ATV service.

Moreover, MPA notes that manufacturers generally indicate the cost of a display is related to the diagonal dimension of the display. If that were the case, for a given display cost, changing the screen aspect ratio from 16:9 to 2:1 would result in a slightly larger picture size (5.3%) for a motion picture with an aspect ratio of 2.4:1, but results in a total screen area that is reduced by 6.4%, a decreased picture size

(9.9%) for the 80% of motion pictures that have an aspect ratio of 1.85:1, and an even greater reduction of picture size (16.8%) for material with an aspect ratio of 4:3.

It is not clear that an aspect ratio wider than 16:9 for advanced television would provide any benefits to the public. Indeed, it appears that a wider aspect ratio would represent a net loss to the public, both in terms of the cost of digital receivers and the overall amount of original material that can be displayed without panning and scanning or "letter boxing."

II. IN LIGHT OF THE ENORMOUS INVESTMENT TO DATE BY THE INDUSTRY, THE GOVERNMENT AND THE PUBLIC IN THE EXISTING TELECOMMUNICATIONS INFRASTRUCTURE, INTEROPERABILITY OF DIGITAL TELEVISION WITH OTHER MEDIA IS A CRITICAL GOAL OF THIS PROCEEDING

The Commission noted that the Committee on Advanced Television Service ("ACATS") treated interoperability as having critical importance and that ACATS addressed interoperability between terrestrial broadcasting, cable television, direct broadcast satellite and computer systems. ACATS believes the ATSC Standard strikes the best balance between various technical considerations and the needs of different industries. MPAA agrees with this assessment. A maximally interoperable standard will make it less expensive and easier for U.S. program providers to market their programming across different media and overseas. The ATSC Standard is flexible, with square pixels, progressive scanning, use of headers and descriptors, etc. The Standard was not optimized for any one industry segment. It was optimized to provide maximum benefit to the public in accommodating the different needs of many different industry segments.³ Therefore, U.S. program providers will be able to serve audiences efficiently with an interoperable standard.

³ For example, the ATSC Standard supports a variety of picture formats. Of the eighteen alternative picture formats, fourteen are progressive and four are interlaced. Progressive is available at all picture rates, at all vertical line and horizontal pixel configurations, in all aspect ratios. The National Television System Committee (NTSC) developed the monochrome and the current color television standards which are analog systems. The NTSC rules provide for a total of 525 lines. Under the ATSC Standard the 720 line and 1080 line formats represent high resolution video and might be used for motion pictures, other programs captured on film, programs shot with DTV cameras, and animation and graphics that might be

Any discussion of interoperability must begin by recognizing that the digital ATV Grand Alliance system and the ATSC Standard recommended to the Commission by the Advisory Committee represent by far the most interoperable broadcast television system ever conceived. Various subcommittees and working parties of the Advisory Committee, including a special working party dedicated to this issue and two specially organized interoperability review panels, worked diligently over the past five years to ensure that the technical standards maximized interoperability with other media, such as computers and telecommunications. Three of the ten criteria used by the Advisory Committee in evaluating technical proposals related to interoperability. In developing the final specifications for the Grand Alliance prototype system in 1993, first the Grand Alliance members and then the Advisory Committee, through its interoperability review panel, worked to ensure that the final system incorporated the best interoperability features of the predecessor comparable systems while adding features that further promoted interoperability. The system's all-digital layered architecture, its packetized data transport structure, its use of headers and descriptors, its support of multiple picture formats and frame rates with a heavy emphasis on progressive scan and square pixels, and its compliance with MPEG-2 international compression and transport standards, give it unprecedented, unmatched interoperability with computers and telecommunications.

It has been argued that interlaced scanning is not sufficient for text or computer generated images, so the inclusion of only one interlaced format in the Standard could stifle the development of educational, scientific and other services that seek to incorporate both video images and computer based information. To the contrary, the ATSC Standard emphasizes progressive scan, utilizing progressive scan for fourteen of the eighteen picture formats. In addition, all of the HDTV formats and the 480Vx640H format, including the two interlaced formats, are square pixel formats, an important characteristic for facilitating interoperability with computers.

computer generated. The lower resolution 480 line formats accommodate existing NTSC programming and equipment as well as material designed for viewing on VGA computer monitors.

This means broadcasters and others, if they wish, can easily use progressive scan transmission formats for program material that use text and graphics or for other video that is likely to be viewed on computers.

Moreover, it is important to distinguish transmission formats from display formats that may be implemented in receivers. The Commission does not and should not regulate display or production formats, only transmission formats. Additionally, in a digital system, transmission and display formats are no longer linked and need not be the same. Concerns voiced regarding interlaced scanning center around display formats, yet it is a transmission standard, and not a display standard, that is properly before the Commission. As the Grand Alliance demonstrated conclusively at the Commission's December 1995 En Banc Hearing, text that is compressed, transmitted and displayed in interlaced format can deliver acceptable performance. Consequently, several computer companies recently have announced joint ventures involving the provision of information services using DBS and other television delivery media. These ventures all utilize interlaced scan, and presumably offer acceptable performance.

Ignoring the benefits that interlaced scanning can provide for many types of traditional television programming would unduly limit applications of proven importance to broadcasters and viewers. Interlaced scanning enhances spatial resolution at a modest compromise in temporal frame rate. While interlaced scanning may not be optimum for computer text and graphics applications, it has a long track record of proven value and successful use in traditional television broadcasting. In addition, broadcasters must be concerned about the interoperability of an ATV transmission standard with currently available ATV production equipment and with the installed base of NTSC production and studio equipment, virtually all of which employ interlaced scanning.

In evaluating recommendations to eliminate interlaced transmission formats from the ATSC Standard altogether, the Commission should note that, with today's technological limitations, such an action would mean that a 720 line progressive format would be the only format for HDTV digital live video programs. A substantial

body of experts believes that a true high-definition format must have more than 1,000. Elimination of the 1080 line interlaced ATV format from the proposed Standard would cause a substantial loss of high quality program material for the public. Moreover, it must be recognized that the proposed ATSC Standard is the only digital television development effort in the world that stresses interoperability with computers and telecommunications (e.g., by including among other things progressive scan and square pixels).

Finally, regardless of the technical arguments about the acceptability of interlaced formats for certain classes of applications, continued insistence on eliminating interlaced formats from the standard is unwarranted.⁴ The ATSC technical standards contain numerous progressive scan and square pixel formats to support the applications that benefit from those attributes. If judged superior by the marketplace, the use of progressive scan formats, whether for transmission formats or display formats, surely will proliferate. Indeed, when technological advances support greater than 720 line progressive formats for live video, it is likely that the digital television industry will migrate to the progressive formats of the ATSC Standard exclusively.

Throughout the nine-year Advisory Committee process, laboratory and field tests focused on ensuring that the digital ATV system developed for terrestrial

⁴ Some members of the computer industry have also complained about the 60 Hz transmission rate, again confusing transmission formats with display formats. For example, Apple states "the proposed transmission rate of 60 Hz is of particular concern. A 60 Hz display rate has not proven to be sufficient for the display of text and fine graphic information with the resolution expected by computer users." These complaints are unwarranted. First, computers, or televisions used in computing applications, could easily and accurately convert the received 60 Hz signals into 72 Hz display rates employing the same frame rate conversion techniques commonly used to convert 50 Hz television around the world to 60 Hz NTSC used in the Americas and Japan. Second, flicker is certainly not a problem for motion video which will continue to comprise the bulk of television viewing applications, nor is it likely to be a problem for still images with the larger screen size, greater viewing distances, and lower lighting levels that will generally be associated with ATV applications. Indeed, no one argues that a 60 Hz display rate causes flicker problems for motion video, and for still pictures, the screen can easily be refreshed at any higher rate desired with only modest additional cost added to the receiver. Third, higher transmission frame rates would have to come at the expense of either reduced spatial resolution or increased compression artifacts in order to continue to fit the coded signals within a 6 MHz terrestrial channel. Finally, in all events, the Commission should not regulate the features of displays, as the computer industry has long held.

broadcast also would meet the needs of cable and other video delivery media. As voluntary standards activities continue in these industries, elements of the terrestrial ATV standard may be incorporated in emerging voluntary standards in these industries. The Commission should encourage private industry to pursue as much interoperability as possible in order to spare consumers unnecessary technical or economic obstacle in switching between, or adding alternative sources of video programming. Such interoperability would promote the early availability of digital television over all of these other media, as well as terrestrial broadcast television, without causing undue burdens on other video providers.⁵

III. Conclusion

The U.S. broadcasting, television and computer industries are among the largest and fastest growing sectors of the U.S. economy.⁶ These industries contributed at least an estimated \$24 billion in foreign revenues to the U.S. economy in 1994. Together with other copyright-based industries, the filmed entertainment industry is second only to motor vehicles and automotive parts among U.S. industries in terms of estimated foreign sales and exports.⁷

MPAA believes it is in the best interests of U.S. program providers to lead the way in promoting the emergence of common worldwide technical standards. In particular, the 16:9 aspect ratio of the ATSC Standard, also adopted in Europe and Japan, will facilitate international program exchange by minimizing the cost of technology conversion and thereby maintaining cost competitiveness. Additionally, the ATSC Standard is sufficiently flexible to conform to existing international

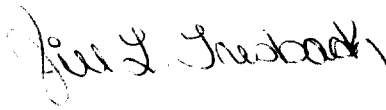
⁵ Stephen E. Siwek, *Copyright Industries in the U.S. Economy: 1977-1993*, 3 (1995) (prepared for the International Intellectual Property Alliance by Economists Incorporated).

⁶ Siwek, *Supra* at 6.

⁷ *Id.* "Other Copyright based industries" is defined as those industries that create copyrighted works as their primary product. These industries include the motion picture industries, the music and recording industry, the computer industry and television and cable broadcasting industries. *Id.*

agreements on digital television and thus will present minimal technical barriers to the continued flow of programming from and to all parts of the world. Finally, the Standard offers a variety of scanning parameters, including interlaced, which will provide maximum interoperability with other video media.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Jill L. Tresback".

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